

Aditya Gulati

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International Institute of Information Technology, Bangalore

Dynamic Decision Making Laboratory, Carnegie Mellon University

AREAS OF INTEREST

Human-Machine Teaming, Decision Making, Artificial Intelligence, Machine Learning

EDUCATION

Integrated MTech in Computer Science (Bachelors +Masters)

2016-2021

International Institute of Information Technology, Bangalore

- GPA: 3.87/4
- Placed on the Deans Merit List every year

CURRENT RESEARCH

Human-Machine Teaming

Lab: Dynamic Decision Making Lab, Carnegie Mellon University; Supervisor: Prof. Cleotilde Gonzalez

We are working on understanding how humans make decisions in complex and dynamic environments - alone and in a team. We are also exploring the use of Instance Based Learning Theory to model agents with different skills which work together to solve a task in a gridworld.

POSITIONS

Visiting Scholar

Ongoing

DDMLab, Carnegie Mellon University

- Working as a visiting researcher at the Dynamic Decision Making lab at Carnegie Mellon University under [Prof. Cleotilde Gonzalez](#). I worked here as a summer intern and am now working on my masters thesis.

Student Affiliate

Ongoing

Multimodal Perception Lab, IIIT-Bangalore

- Working as a student partner in the Multimodal Perception Lab under [Prof. Dinesh Babu](#).

Reviewer

Ongoing

Sadhana

- Reviewing papers for Sadhana, a Springer journal in India.

DAAD Scholar

2019

Vision and Perception Science Lab, Ulm University

- Received a scholarship from the [DAAD](#) over the summer of 2019 while I was a research intern under [Prof. Dr. Heiko Neumann](#). Worked on a brain inspired motion estimation system.

Teaching Assistant

2020

IIIT Bangalore

- Teaching assistant for courses on *Linear Algebra (Spring 2020)* and *Automata Theory and Computability (Fall 2020)*. Responsibilities included conducting classes, setting quizzes and grading papers.

Core Team Member

2016-2019

Enigma (Robotics Club, IIIT-Bangalore)

- Worked on setting up and delivering projects for IIIT Bangalore's first robotics club.

TECHNICAL SKILLS

Programming Languages - Python, Julia, C++, C, MATLAB, Java

Libraries - OpenCV, PyTorch, Pandas, Numpy

Hardware - Arduino, Raspberry Pi

Tools - Git, L^AT_EX, Docker

SELECTED PROJECTS

Sociological Theories of The Mind

2020

Supervisor: Prof. Bidisha Chaudhuri

In recent years, studying the mind has become interesting for computer scientists. However, before this spike, there were multiple studies performed to better understand various aspects of the mind by sociologists, many of which continue to this day. Here, we look at some of these theories and the gap that exists between them and where AI stands today.

Text Style Transfer

2020

Supervisor: Prof. G Srinivasaraghavan

We created an end-to-end model designed to change the sentiment of a given sentence while retaining the context of the sentence. Our model combined the input sentiment with embeddings generated by BERT and shifted these to embeddings used by GPT2. These embeddings were fed to GPT2 which used them to generate the new sentence.

Making Decisions With Different Thinking Styles [[Preprint](#)]

2019-2020

Supervisor: Prof. Shrisha Rao

Daniel Kahneman in his book 'Thinking, Fast and Slow' proposed that we have two systems of thinking that we use to make decisions - a slow logical system and a fast intuition based system. However, while performing a certain task we don't always use these systems independent of each other to make decisions. In this work, we explored methods of incorporating these different styles of thinking to make better decisions overall. Our ideas were tested on Pac-Man, a classic arcade game. *Publication pending.*

Motion Detection Using Brain Inspired Models

2019

Lab: Vision and Perception Science Lab ; Supervisor: Prof. Dr. Heiko Neumann

We were designing a system to detect motion in a sequence of images using our understanding of the V1 and MT regions of the visual cortex. We modelled the V1 cells as spatio-temporal filters and estimated the motion energy. Our MT cells pool these responses and were used to estimate velocity at every point in the image. This was designed to be used on input from an event-based camera.

Unsupervised Domain Adaptation

2019

Lab: Multimodal Perception Lab ; Supervisor: Prof. Dinesh Babu

Training a neural network requires a lot of data. A method to avoid this would be of great help to the community. We built a system which learns the persuasiveness of a speaker in a video in a labelled source domain and transfers this learning to a related but unlabelled target domain.

Automated Vehicle Counting

2018

Lab: Multimodal Perception Lab ; Supervisor: Prof. Dinesh Babu

Laid the foundations for a system to help improve automatic car counting methods for Indian road conditions (where large volumes of traffic and lack of lane discipline make traditional methods unsuitable). Our aim was to create a system that runs in near real time while maintaining accuracy. We tried to achieve this using a hybrid detector which used YOLO and FastRCNN as submodules. The system designed takes a video as input and tracks vehicles across frames.

RELEVANT COURSES

Math - Linear Algebra, Sequences and Series, Probability and Statistics, Bayesian Statistics, Differential Equations, Discrete Maths (Set Theory, Graph Theory)

Data Science - Machine Learning, Probabilistic Graphical Models, Artificial Intelligence, Reinforcement Learning, Natural Language Processing, Artificial General Intelligence

Computer Science - Data Structures & Algorithms, Database systems, Operating Systems, Programming Language Theory, Computational Geometry

Social Sciences - Economics, A History of Ideas, Digital Sociology, Techno Economics of Networks